

8.5

Area of Parallelograms

Goal Find the area of parallelograms.

VOCABULARY

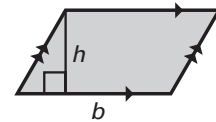
Base of a parallelogram Either pair of parallel sides of a parallelogram are called the bases of a parallelogram.

Height of a parallelogram The shortest distance between the bases of a parallelogram is called the height of a parallelogram. The segment that represents the height is perpendicular to the bases.

AREA OF A PARALLELOGRAM

Words The area of a parallelogram is the product of a base and its corresponding height.

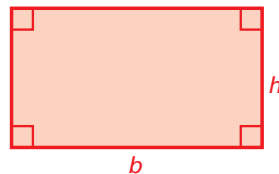
Symbols $A = bh$



Follow-Up

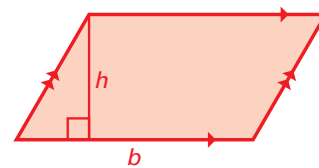
For each formula, draw a diagram and write the formula.

Area of a Rectangle



$$A = bh$$

Area of a Parallelogram



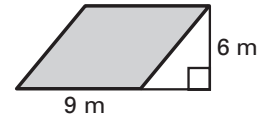
$$A = bh$$

Compare the formulas.

They are the same.

Example 1 Find the Area of a Parallelogram

Find the area of the parallelogram.

**Solution**

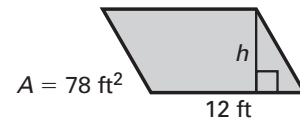
Use the formula for the area of a parallelogram.

Substitute 9 for b and 6 for h .

$$A = bh = (\underline{9})(\underline{6}) = \underline{54}$$

Answer The parallelogram has an area of 54 square meters.**Example 2** Find the Height of a Parallelogram

Find the height of the parallelogram, given that its area is 78 square feet.

**Solution**

$$A = bh$$

Formula for the area of a parallelogram

$$\underline{78} = \underline{12}h$$

Substitute 78 for A and 12 for b .

$$\underline{6.5} = h$$

Divide each side by 12.Answer The height of the parallelogram is 6.5 feet.**✓ Checkpoint** Find the area of the parallelogram.

1. 96 yd^2	2. 77 mm^2	3. 196 ft^2
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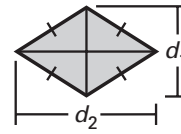
In Exercises 4–6, A represents the area of the parallelogram. Find the missing measure.

4. $A = 72 \text{ in.}^2$ $h = 6 \text{ in.}$	5. $A = 30 \text{ m}^2$ $b = 6 \text{ m}$	6. $A = 28 \text{ cm}^2$ $h = 4 \text{ cm}$
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AREA OF A RHOMBUS

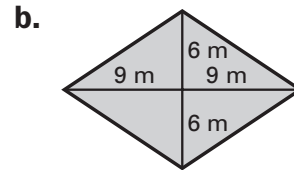
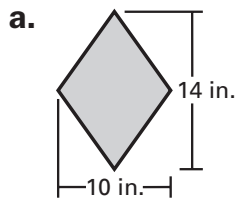
Words The area of a rhombus is equal to one half the product of the lengths of the diagonals.

Symbols $A = \frac{1}{2}d_1d_2$



Example 3 Find the Area of a Rhombus

Find the area of the rhombus.

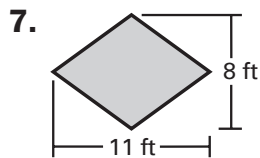


Solution

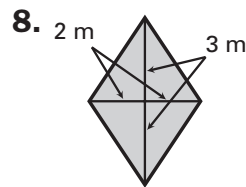
a. $A = \frac{1}{2}d_1d_2 = \frac{1}{2}(\underline{14})(\underline{10}) = \underline{70}$ square inches

b. $A = \frac{1}{2}d_1d_2 = \frac{1}{2}(\underline{18})(\underline{12}) = \underline{108}$ square meters

✓ Checkpoint Find the area of the rhombus.



44 ft^2



12 m^2



40 cm^2